

[0006] An object of the present invention is to provide an apparatus and a method which prevent the overheating and destruction of MOVs in an over-voltage protection circuit by providing an efficient circuit configuration (*i.e.*, the minimum number of components for device size reduction) which assures a rapid simultaneous disconnect of both the hot line and neutral power lines, and responds to the overheating of MOVs in an over-voltage protection circuit by opening the circuit to simultaneously disconnect both the hot line and the neutral line feeding a load when the over-voltage event occurs in the line-to-neutral (L-N) pairing.

[0007] Another object of the present invention is to provide an apparatus and a method which prevent the hazardous condition occurring at the wall receptacle which arises from accidental reversal of the line wire with the neutral wire from adversely affecting at least one peripheral device in the line, by detecting such reversal upon connection of the apparatus to the wall receptacle and alerting the user to the hazardous condition by appropriate illumination of warning lights or sounding of an audible alarm, or both. The user can then effect a correction before proceeding.

[0008] Accordingly, the present invention provides a single-phase over-voltage protection circuit apparatus for all AC power lines and combinations thereof. In particular, the present invention provides an apparatus and a method which (1) indicates the hazardous condition occurring at the wall receptacle arising from accidental reversal of the line wire with the neutral wire from adversely affecting at least one peripheral device in the line by alerting the user to the unsafe condition, and (2) the overheating and destruction of MOVs in an over-voltage protection circuit by providing an efficient circuit configuration which assures a rapid simultaneous disconnect of both the hot line and neutral line. The present invention achieves this by opening the circuit to disconnect either or both of the hot line and neutral line feeding a load when the over-voltage event occurs in the hot line to neutral line (L-N) pairing.

[0019] The apparatus 10 may further comprise a warning feature 40 (*i.e.*, an indicator or indicators that the hot line and neural line are reversed and/or an over-voltage indicator) for indicating that at least one of the four MOVs 20 has responded to an over-voltage condition which has effected opening of at least one respective thermal fuse 30. The warning feature 40 comprises at least one warning feature selected from a group of warning features consisting essentially of an indicator light, an LED indicator, and/or an audible alarm such as a buzzer or the like, warning that AC power has been disconnected to the peripheral equipment due to

an over-voltage (O-V) condition. The warning devices may include normally-on green indicators indicating proper operation and/or red indicators indicating a fault operation when illuminated. As depicted and by example only, the warning feature 40 is separately energized from the input AC power source through circuit 11a-12a. When an overvoltage causes disconnection of either hot line 11 or neutral line 12, appropriate indicator lights will be illuminated and/or an audible alarm may sound, indicating that the device 10 has disconnected power to the load. The apparatus 10 may be disengaged from the power source after alerting by the warning feature 40, and may then be replaced or reset. Apparatus 10 may optionally include ON/OFF switches (not shown), for power distribution, and/or for safety considerations. Further, apparatus 10 may include electronic filters at either the input 14 or output 15 sides to remove interference such as static or noise, as is known in the art.

[0021] The apparatus, as described in Example 1, may further comprise an indicator or indicators that the hot line and neutral lines are reversed and/or at least one warning feature for indicating that an over-voltage condition has occurred, the indicators and at least one warning feature being selected from a group of warning features consisting essentially of an indicator light and an LED indicator.

In the Claims:

Please amend Claims 1-3, 6-7, 9, 11, 13-14, and 16-18 as follows: